

What is claimed is:

1. A process for manufacturing a tire vulcanizing mold, comprising making at least part of a mold element for a tire tread portion out of a sintered member and a mold element for the mating portions of the mold out of a member having fewer pores than the sintered member or no pores in order to provide a density distribution to the mold.

2. The process for manufacturing a tire vulcanizing mold according to claim 1, wherein part or all of the tire vulcanizing mold is manufactured by a powder sintering method in which sinterable powders are heated and sintered by local heating means to form layers and a density distribution is provided to the sintered body.

3. The process for manufacturing a tire vulcanizing mold according to claim 2, wherein the powders are heated and sintered by applying a laser beam and a density distribution is provided to the sintered body by controlling the output of the laser beam.

4. The process for manufacturing a tire vulcanizing mold according to claim 2, wherein the powders are heated and sintered by applying a laser beam, and a density distribution is provided to the sintered body

by controlling the exposure time of the laser beam.

5. The process for manufacturing a tire vulcanizing mold according to any one of claims 2 to 4, wherein the porosity of the sintered body is changed by varying the size of the powders when the powders are heated and sintered.

6. The process for manufacturing a tire vulcanizing mold according to any one of claims 2 to 5, wherein the powders are metal or alloy powders.

7. The process for manufacturing a tire vulcanizing mold according to claim 6, wherein the powders are aluminum powders.

8. The process for manufacturing a tire vulcanizing mold according to any one of claims 1 to 7, wherein the tire vulcanizing mold is a piece type tire mold comprising a plurality of pieces for forming a tread pattern on a side in contact with the tread forming portion of a tire, and some or all of the pieces are manufactured by the powder sintering method.

9. The process for manufacturing a tire vulcanizing mold according to claim 8, wherein the plurality of pieces are integrally manufactured by the powder

sintering method, and an air bleeder slit is formed at the boundary between adjacent pieces by weakening or omitting the application of a laser beam to the powders in a predetermined area between the pieces.

10. The process for manufacturing a tire vulcanizing mold according to claim 8, wherein the pieces are each manufactured by the powder sintering method, and an air bleeder slit is formed in piece dividing surfaces by weakening or omitting the application of a laser beam to at least some or all of powders in contact with the piece dividing surfaces of the piece.

11. The process for manufacturing a tire vulcanizing mold according to claim 1, wherein a mold element arranged around the projection of at least a tire crown portion is manufactured by the powder sintering method and the mold element composed of this sintered body is assembled with a separately manufactured mold body or piece.

12. The process for manufacturing a tire vulcanizing mold according to claim 11, wherein the mold element is set in a mold for casting the mold body or the piece and assembled with the mold body or piece at the time of casting.

13. The process for manufacturing a tire vulcanizing mold according to claim 11, wherein the mold element is buried in the separately cast mold body or piece.

14. The process for manufacturing a tire vulcanizing mold according to any one of claims 1 to 13, wherein to manufacture at least part or all of the mold or at least some or all of the pieces by the powder sintering method in which sinterable powders are heated and sintered to form layers, a tire 3-D CAD is used to create a model of the tire, lamination models are created by dividing this model with parallel planes having a predetermined angle, and the powders are heated and sintered for each layer based on the lamination models.

15. The process for manufacturing a tire vulcanizing mold according to claim 14, wherein the lamination pitch is 0.1 to 0.5 mm.

16. A tire vulcanizing mold comprising a sintered member for a tire tread portion and a member having few pores or no pores for the mating portions of the mold.

17. The tire vulcanizing mold according to claim 16, wherein part or all of the tire vulcanizing mold is manufactured by heating and sintering sinterable powders with local heating means to laminate layers.

18. The tire vulcanizing mold according to claim 17, wherein a mold element arranged around the projection of at least a tire crown portion is manufactured by the powder sintering method.

19. The tire vulcanizing mold according to any one of claims 16 to 18, wherein the tire vulcanizing mold is a piece type tire mold comprising a plurality of pieces for forming a tread pattern on a side in contact with the tire tread forming portion of a tire.

20. A process for manufacturing a tire vulcanizing mold, comprising the steps of:

manufacturing at least part or all of a mold by a powder sintering method in which sinterable powders are heated and sintered to laminate layers, and

infiltrating a metal or alloy into the pores of the laminated sintered body of the mold.

21. The process for manufacturing a tire vulcanizing mold according to claim 20, wherein the density of the mold is controlled by adjusting the infiltration of the metal or alloy.

22. The process for manufacturing a tire vulcanizing mold according to claim 20 or 21, wherein the powders

are metal or alloy powders.

23. The process for manufacturing a tire vulcanizing mold according to claim 22, wherein the powders are aluminum powders.

24. The process for manufacturing a tire vulcanizing mold according to any one of claims 20 to 23, wherein the metal or alloy to be infiltrated is copper, aluminum, or copper or aluminum alloy.

25. A tire vulcanizing mold manufactured by forming part or all of the mold by a powder sintering method in which sinterable powders are heated and sintered to laminate layers, wherein a metal or alloy is infiltrated into the pores of the laminated sintered body of the mold.

26. The tire vulcanizing mold according to claim 25, wherein the powders are aluminum powders, and the alloy to be infiltrated is an aluminum alloy.

27. The tire vulcanizing mold according to claim 25, wherein a blade planting groove portion for forming the sipe of a tire of the mold is composed of the laminated sintered body.

28. The tire vulcanizing mold according to any one of claims 25 to 27, wherein a blade for forming the sipe of a tire is composed of the laminated sintered body.

29. The tire vulcanizing mold according to any one of claims 25 to 28, wherein a slit groove portion for discharging air of the mold is composed of the laminated sintered body.